STAFF WORKING PAPERS

PRODUCTIVITY IMPROVEMENT UNDER THE GOVERNMENT'S PRODUCTIVITY IMPROVEMENT INITIATIVE

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NOTES

Unless otherwise indicated, all years referred to in this report are fiscal years.

The estimates in this report should not be confused with productivity data recently published by the Office of Management and Budget in Management of the United States Government, Fiscal Year 1990. The OMB report covers different activities, different resources, and a different period of time.

Unless otherwise noted, employment figures in text and tables are presented on a full-time equivalent basis. Under this method of measurement, employment is translated to its full-time equivalent. Two half-time workers, for example, would count as one full-time equivalent.

PREFACE

This Congressional Budget Office staff working paper analyzes recent experience under the productivity improvement program launched by President Reagan in 1986.

The study was prepared at the request of Congressman Vic Fazio, Chairman of the House Appropriations Subcommittee on the Legislative Branch and of the Federal Government Service Task Force. R. Mark Musell of CBO's Office of Intergovernmental Relations prepared the report under the supervision of Stanley L. Greigg and Earl Armbrust. Steve Celio and Drew Larson provided research support. Mary V. Braxton typed the draft and prepared the report for publication. Questions concerning the analysis should be addressed to the author at 226-2616.

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SUMMARY

In February 1986, President Reagan launched a governmentwide effort to improve the productivity of federal operations and the quality of government services. By 1992, the program, under the general direction of the Office of Management and Budget, is expected to cover nearly 630 federal activities involving almost 2 million jobs. For selected activities, early efforts have resulted in savings of almost $1 billion.

CHANGES IN UNIT OPERATING COSTS

Data reported for 14 selected nondefense activities covering about 235,000 federal jobs show overall productivity has improved. Improvement is defined here as a drop in the inflation-adjusted operating cost to produce each unit of an agency's product or service. Between 1985 and 1987, average annual unit costs for all 14 activities as a group fell by 2.5 percent. (This rate falls below the 3 percent rate that would be required to meet the productivity program's original long-term goals.) Performance, however, varied widely by activity (see Summary Figure). Eleven activities show average annual decreases in costs ranging from 3 percent to 10 percent for the period. Three activities show increases in average annual costs ranging from 3 percent to 22 percent.

ESTIMATED SAVINGS

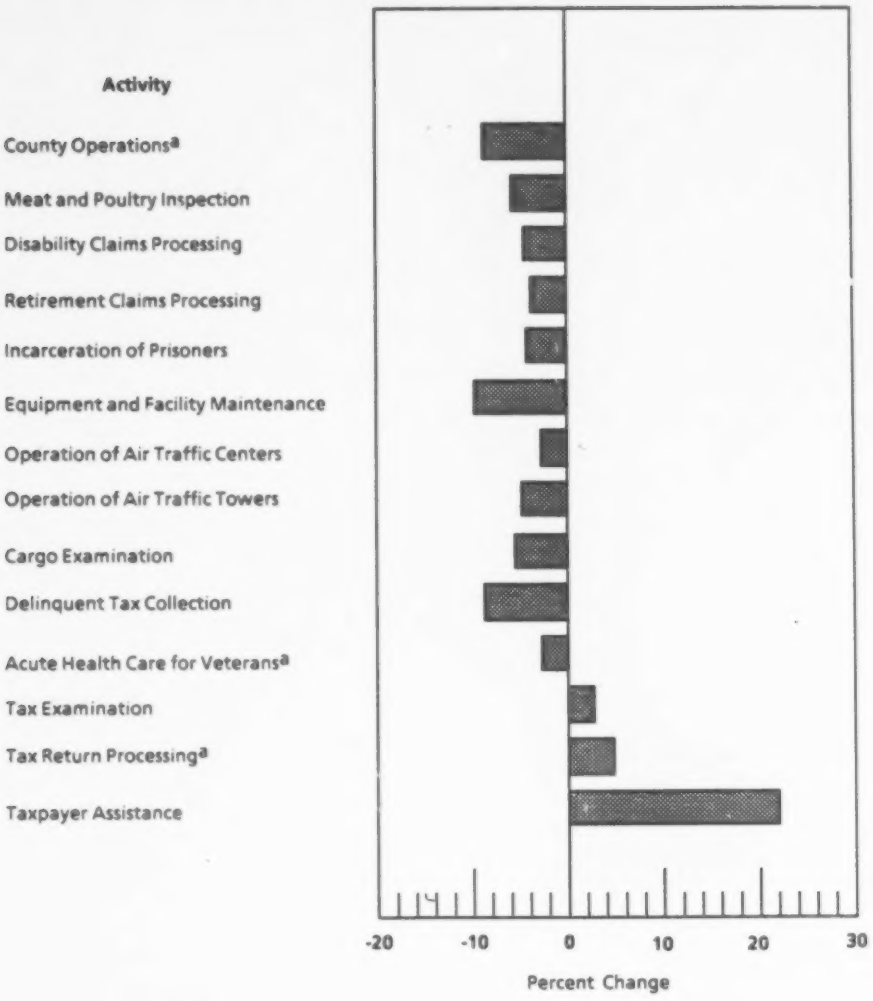
Net savings to taxpayers as a result of productivity improvement total an estimated $940 million through 1987. (These savings, estimated in 1988 dollars, represent increases in operating costs avoided. How such cost avoidance affects federal budget balances cannot be determined.) Eleven activities achieved two-year savings ranging from $35 million to $245 million. Cost increases for the three activities with rising unit costs totaled $290 million.

Improvements in labor productivity, measured in terms of the amount of work handled by each employee, account for the largest portion of savings--almost 95 percent of the estimated net savings under the program. For the 14 activities analyzed by the Congressional Budget Office, the amount of work associated with each federal employee grew at an average annual rate of 3.9 percent between 1985 and 1987. (This rate is about double the comparable average for all nonpostal, nondefense activities as reported by the Bureau of Labor Statistics.) Experience, of course, varied by activity. The 11 activities showing decreases in unit costs each show improvements in labor productivity. These improvements range from an average of 1.3 percent to 13.0 percent per year. Not surprisingly, all three activities with increases in unit costs show a drop in worker productivity.

THE GROWING DEMAND FOR FEDERAL SERVICES

The observed trends in federal unit costs are driven by a variety of factors, not all of them related to actions initiated as part of the government's productivity program and not all directly under the control of agency management. In general, the experience with unit costs described above reflects continuing budgetary pressures

Summary Figure.
Average Annual Change in Unit Costs Between 1985 and 1987, By Activity



SOURCE: Congressional Budget Office from unpublished agency reports.

NOTE: Data represent changes in real operating costs per unit of output.

a. Data are for 1986 and 1987 only.

in government. Such pressures have forced government programs to get by with fewer resources, even as they face a growing demand for their products and services. Indeed, only one of the 14 activities sampled by CBO reported a decrease in output (and agency information suggests that the drop is accurately interpreted as improved quality, rather than less service).

How agencies managed to handle more work with fewer resources is not clear in every case. Agencies could not always explain the data they have thus far collected and reported. In some cases, agencies offered examples of streamlining, automation, consolidations, and other improvements initiated as a result of the productivity program or one of the government's many other efforts to enhance management. Available information also reveals cases where the combination of tight resources and growing demand has forced decreases in the quality of the services rendered. With tight budgets likely to continue well into the future, agencies could eventually exhaust the means to meet effectively the growing demand for services, and problems of declining quality in government services could become more widespread.

PROBLEMS WITH AGENCY DATA

Managers overseeing current productivity efforts will have to address inconsistencies in how agencies report certain costs if data collected under the program are to prove useful in managing and evaluating federal operations. Good data on the quality and timeliness of services, for example, is not yet available for many activities. Also, CBO's analysis shows that agencies follow very different practices in reporting their capital expenses, making meaningful comparison and evaluation of such costs impossible. Accordingly, CBO's estimates of costs and savings under the productivity program cover only operating expenses--including the cost of employee compensation and the cost of nonlabor, noncapital resources such as supplies. In addition to problems associated with the reporting of capital costs, agency reporting of employee compensation costs contains anomalies that mask progress under the program. These anomalies were occasioned by changes in government accounting under the Federal Employees' Retirement System. To correct this situation, CBO estimates incorporate the full accrual cost to the government of all employee retirement benefits earned throughout the period of analysis. Even with CBO's adjustments, estimates should be viewed as tentative. Agency reports are subject to revision, and recent experience may not be representative of what the program will accomplish in the future.

CHAPTER I. THE PRODUCTIVITY IMPROVEMENT PROGRAM

In 1986, President Reagan established a governmentwide program to improve theefficiency, timeliness, and quality of government services. [1] The program represents one part of a broader, ongoing effort to improve government management. The program originally had set as a goal an average annual improvement in productivity of about 3 percent, which agencies were to achieve while maintaining the level and quality of services. Current guidance, however, stresses the importance of continuous improvement, without targeting a specific rate of productivity growth. According to inventory data collected by the Office of Management and Budget (OMB), the program eventually will cover activities involving almost 2 million jobs.

Productivity improvement offers a way of holding down federal costs that does not involve cuts in services. This aspect of improvement efforts has particular appeal now as the Congress continues to search for ways to deal with large budget deficits. The Congress may confront the issue of productivity improvement in a number of contexts. It may be asked to sanction reorganizations, personnel reforms, capital investments, or other aspects of agency improvement plans. In authorizing or reauthorizing programs, the Congress may wish to consider how mandated procedures or organizational structures may affect efforts to improve productivity. The subject of productivity could also arise in connection with debates about the appropriate level of funding for different programs. In an effort to assist the Congress with any decisions it may make concerning productivity improvement in government, this paper reviews the experience through 1987 of some of the first activities to participate in the productivity program.

Because the program is still young, the results described in this analysis should be viewed as highly tentative. Agencies will undoubtedly revise information previously reported, and initial findings can easily change. The productivity improvement program is scheduled to expand greatly, and experience to date may not be representative of future accomplishments. Preliminary reports reveal that the government has held down costs as the demand for its services has grown--dramatically in some cases. How agencies accomplished this is often unclear, as is the impetus for many of the measures taken. Accordingly, the implications of agency actions for agency management and for citizens who pay taxes and depend on government services are not fully apparent. The data suggest, however, where concerns about the government's performance might be raised. They also illustrate the kinds of problems that arise when attempting to interpret and evaluate productivity in government.

Current efforts to improve productivity are the most recent in a long series of attempts by government to make its operations more efficient. Earlier efforts have been described as largely disjointed, short-lived, and ineffective. [2] Features that characterize the current program include:

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1. Executive Order 12552 of February 25, 1986, and Executive Order 12637 of April 27, 1988, establish the productivity program in broad outline. Details concerning development, implementation, and use of data are spelled out in Office of Management and Budget, Circular A-132, April 22, 1988. Authority to undertake such an initiative derives from the Budget and Accounting Act of 1921, as amended, and from other authority.

2. General Accounting Office, Increased Use of Productivity Management Can Help Control Government Costs (November 1983), p. 2.

- Its governmentwide scope;
- Its use of overall improvement goals;
- Its drive to make productivity improvement and concern about the quality of services an integral part of agency management; and
- The visibility and focus given the effort by making the Office of Management and Budget responsible for overall guidance and coordination and by requiring senior management at each agency to support the efforts to improve productivity.

Although it is too early to know whether the current effort will meet the expectations of its architects, in many ways the program's design fits the profile of a successful productivity management effort as outlined by the General Accounting Office. [3]

THE ROLE OF FEDERAL AGENCIES

The focus of productivity improvement efforts under the current program rests with agencies. Each agency establishes its own productivity program, adapting general OMB guidelines to individual agency requirements. These programs operate under the direction of top management. Activities selected for the effort must, per OMB guidance, provide a measurable product or service used by people outside the agency. Agencies will gradually expand the activities covered by the program. By 1992, OMB expects that about 630 federal functions performed by 20 different federal agencies and departments will be engaged in efforts to improve productivity. These efforts will involve almost 2 million jobs, or about 90 percent of all civilian jobs outside the U.S. Postal Service. Three agencies account for about 80 percent of these jobs--the Department of Defense, the Department of the Treasury, and the Department of Veterans Affairs (see Table 1).

Agencies have initiated, or plan to initiate, a variety of efforts designed to improve operations and reduce costs. These efforts include the introduction of new technologies, the consolidation of facilities, and the streamlining and simplification of procedures. Some agency plans--for example, those involving investment in new technology--may cause costs to increase under the productivity program, at least in the near term.

THE ROLE OF OMB

The Office of Management and Budget is responsible for developing guidelines to assist agencies in putting together a productivity program. In its role as coordinator and monitor, OMB requires periodic reports from agencies on the status and accomplishments of their productivity initiatives. The OMB also receives annual plans that outline agencies' programs of action for future productivity improvement. These plans describe, among other things, the activities included in an agency's program, its long-term objectives, the techniques agencies will use to improve productivity, and the measures used to gauge performance. Agency plans are submitted as part of annual management reports and are subject to periodic revision.

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3. General Accounting Office, Increased Use of Productivity Management, p. 36.

TABLE 1. FUNCTIONS AND FULL-TIME JOBS TO BE INCLUDED IN PRODUCTIVITY IMPROVEMENT PROGRAMS BY 1992

Department/Agency	Functions	Covered Employment (In thousands)	Employment as Percentage of Total
Defense	150	1,250	64
Veterans Affairs	9	190	10
Treasury	31	112	6
Health and Human Services	44	80	4
Transportation	22	73	4
Agriculture	64	67a/	3
Justice	31	51	3
Interior	41	37	2
Commerce	28	22	1
Labor	49	16	1
General Services Administration	17	9	b/
Housing and Urban Development	29	9	b/
Energy	9	7	b/
Environmental Protection Agency	8	5	b/
U.S. Information Agency	9	5	b/
National Aeronautics and Space Administration	4	4	b/
Education	12	3	b/
State	9	3	b/
Office of Personnel Management	10	3	b/
Federal Energy Regulatory Commission	54	1	b/
Total	630	1,947	100

SOURCE: Congressional Budget Office, from data in the Office of Management and Budget, Management of the United States Government, Fiscal Year 1990, pp. 3-74.

a. Covers both federal and county employees who are paid by the federal government to carry out federal farm programs.

b. Less than one-half of one percent.

At present, there is no direct, systematic linkage between productivity improvement efforts and OMB's annual budget review process, although budget examiners review productivity data when such information is available. As an incentive to improve efficiency, agencies are ordinarily allowed to apply savings toward improving the quality of services or meeting other needs. Budgetary decisions at all levels, of course, will both affect the results of any productivity improvement effort and be affected by them. [4]

PRODUCTIVITY AND ITS MEASUREMENT

Productivity is commonly viewed in terms of the efficiency with which resources are used in a given operation. Measures of efficiency express the relationship between the goods and services produced and the resources consumed to produce them. One could measure the labor productivity of an office that processes claims, for example, in terms of the number of claims processed per year of work. In this example, claims represent the product, or output, and work represents the resources consumed, or input. Measures of efficiency can take many forms, and there has been little consensus in government about what to measure or how to measure it. In service organizations like government, measuring efficiency can prove particularly problematic because outputs are difficult to define and quantify. [5]

Standard measures of productivity share certain other limitations. Most measures indicate only changes and trends in the use of resources without indicating their significance. Generally, it is difficult to get productivity measures to reflect changes in the quality of goods and services. Yet an improvement in efficiency achieved by decreasing either the level or timeliness of services has very different implications in assessing an organization's performance than has an improvement achieved at no cost to quality. Efficiency, moreover, is only one measure of organizational achievement. Most measures of efficiency reveal nothing about an organization's success in meeting its objectives. Improvements in the productivity of a program that approves grants to localities, for example, provides no assurance that mandated goals like job training and community development have been better met. The efficient use of resources can make it easier for an organization to achieve its goals, but efficiency alone is no guarantee that this happens. Programs can be completely ineffective and very efficient at the same time. Clearly, a full assessment of an organization's achievement requires consideration of a variety of measures of performance.

PRODUCTIVITY MEASUREMENT IN THE GOVERNMENT'S PROGRAM

The Office of Management and Budget has chosen to measure the progress of its productivity program by unit cost--that is, the cost to produce each unit of service or combination of service components. Agencies report data on cost and output for specific functions such as issuing licenses. By the end of 1990, agencies anticipate having improvement efforts under way for 265 different functions involving more

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4. Although OMB has established no specific linkage between its productivity program and Presidential funding decisions under the budget review process, it requires agencies to use productivity and other performance indicators to justify staffing and other requirements. See Office of Management and Budget, Circular A-11, June 1988, pp. 28 and 39.

5. For a discussion of the problems associated with measuring productivity in government, see the statement by Alice M. Rivlin, Director, Congressional Budget Office, before the House Budget Committee, Washington, D.C., February 14, 1978.

than 830,000 full-time jobs--about 40 percent of the jobs that could eventually be covered by the program.

In calculating unit costs for these functions, agencies include the costs of all resources consumed in generating output; these costs are later converted to 1985 dollars. (In considering all resources, the current initiative differs from the Bureau of Labor Statistics' productivity program, which measures only labor resources used in government operations. See the appendix.) Costs, as reported to OMB, generally cover three categories of resources: labor, capital (plant and equipment), and "other" (including supplies and contract services). Accounting for capital costs has posed problems for some federal agencies because the government does not practice capital budgeting and because many agencies lack experience in accounting for the cost of assets over their useful life, as required under the productivity program. The limited information currently collected about capital costs, moreover, makes it impossible to calculate a measure of "multifactor" productivity. Such measures relate output to the inflation-adjusted cost of all resources used in production. Calculating these measures requires detailed cost and efficiency data on changes in an agency's stock of productive capital. The absence of the data needed to compute multifactor measures may be one of the reasons OMB chose instead to monitor progress in terms of changes in the average unit cost of service provided.

The measures of output that agencies include in calculations of unit cost usually cover items that provide some direct service to the public--for example, the number of checks issued or of safety inspections completed. When a function entails more than one product or service, agencies weight and combine them. Many agencies use weights based on costs or labor. The Department of Veterans Affairs employs elaborate procedures that first translate all output into standard work units based on cost and other information.

The OMB guidelines also require agencies to report on how they perform against standards they develop to monitor the quality and the timeliness of their services. Tracking the quality and timeliness of services will help agencies determine where they may be achieving efficiency improvement at the expense of good service delivery. At the Department of Health and Human Services, error rates serve as an indicator of quality for claims processing activities. The Department of Justice monitors the quality of incarceration activities in terms of the incidence of assaults, escapes, and overcrowding. Most agencies are just starting to develop such measures of quality, and reliable data are not yet available.

CHAPTER II. PRELIMINARY RESULTS

As mentioned in the previous chapter, the Office of Management and Budget monitors the progress of efficiency in terms of unit cost--the cost to produce each unit of output. Sample data for the first years of the program show that, after adjusting for inflation, costs generally declined, thereby yielding savings for taxpayers. These results, however, are not always attributable to deliberate agency efforts to improve efficiency under the government's productivity program. Rather, changes in unit costs reflect a host of factors, many of which are beyond the direct control of agency management. [6]

THE CBO SAMPLE AND ANALYTIC METHOD

The Congressional Budget Office obtained and analyzed data on unit cost and other factors for 14 nondefense activities in productivity programs as of 1987 (see Table 2 and the box). The information derives mainly from unpublished reports that agencies submitted to OMB for the period 1985 through 1987. These data varied considerably concerning the reporting of capital expenses, making meaningful comparison and interpretation of such data impossible. [7] Information was not available to revise agency data, so CBO limited its analysis to information on operating costs, which agencies reported in two categories--personnel compensation and "other."

CBO adjusted the data reported by agencies on employee compensation to correct for certain anomalies attributable to a change in government accounting for the cost of employee retirement. Under the change, agency budgets began to reflect the accrual cost of retirement benefits for employees covered by the new Federal Employees' Retirement System (FERS). [8] For employees remaining under the Civil Service Retirement System (CSRS), however, agencies continue to pay an amount that falls far short of the full accrual costs eventually borne by the government. The shift

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6. A recent report by the General Accounting Office identifies a variety of factors that can influence the quantity and quality of the work done by federal employees. These factors include the quality of management and leadership, the level of resources available for accomplishing a mission, the amount of feedback to employees about their performance, the level of pay and other compensation, and the skills and abilities of workers. See General Accounting Office, Federal Workforce: A Framework for Studying Its Quality Over Time (August 1988), pp. 17-22.

7. The Internal Revenue Service, for example, was the only agency that included in capital expenses the cost of capital resources already in place and contributing to service delivery. Other agencies reported only additions to capital stock. Agencies also used different formulas to depreciate the capital costs they reported. The Department of Agriculture, however, has not yet adopted a method for depreciating costs and simply reported gross dollars spent for additions to its capital stock. The Departments of Justice and of Veterans Affairs excluded their capital programs from the activities they chose to monitor for productivity improvement.

8. The recently established Federal Employees' Retirement System covers most federal employees hired after December 1983 and others who elected to participate. Beginning in January 1987, agency budgets reflect the full accrual cost to the government for employee retirement benefits earned under the new program. (During the three preceding transition years, agency contributions did not fully cover the employer's accrual cost for FERS entitlements.) For most other workers, agency budgets are charged an amount set by law at 7 percent of pay rather than the full accrual cost to the government. The government costs not charged to individual agencies are eventually charged to a governmentwide trust fund.

TABLE 2. COST AND EMPLOYMENT DATA FOR FOURTEEN ACTIVITIES WITH PRODUCTIVITY IMPROVEMENT PROGRAMS, 1987

Activity	Number of Jobs	Operating Costs (In millions of 1988 dollars)
Agriculture		
County Operations	13,610[a/]	335
Meat and Poultry Inspection	9,200	380
Health and Human Services		
Disability Claims Processing	8,400	745
Retirement Claims Processing	13,340	595
Justice		
Incarceration of Prisoners	11,000	700
Transportation		
Equipment and Facility Maintenance	8,310	590
Operation of Air Traffic Centers	9,330	645
Operation of Air Traffic Towers	9,960	635
Treasury		
Cargo Examination	6,080	325
Delinquent Tax Collection	13,820	610
Tax Examination	29,920	1,465
Tax Return Processing	23,670	880
Taxpayer Assistance	5,790	265
Veterans Affairs		
Acute Health Care	73,290	3,500
Total	235,710	11,665

SOURCE: Congressional Budget Office, from unpublished agency reports.

NOTE: Employment is rounded to the nearest 10 jobs; costs are rounded to the nearest $5 million.

a. Primarily covers county employees paid with federal funds.

FEDERAL ACTIVITIES COVERED BY CBO'S ANALYSIS

Department of Agriculture

County Operations. The administration of loans, purchases, and payments designed to support farmers and to stabilize the price of farm products.

Meat and Poultry Inspection. Activities designed to ensure that meat and poultry are wholesome, unadulterated, and properly labeled; also includes the inspection of meat animals.

Department of Health and Human Services

Retirement and Survivors Claims Processing. The review of initial claims for benefits by retirees and survivors under Social Security.

Disability Claims Processing. The review of initial claims for disability benefits under Social Security.

Department of Justice

Incarceration of Prisoners. The care and custody of federal inmates.

Department of Transportation

Equipment and Facility Maintenance. Upkeep of facilities and equipment in the air traffic control system.

Operation of Air Traffic Centers. The management of air traffic en route.

Operation of Air Traffic Towers. The control of air traffic at or around airports.

Department of the Treasury

Cargo Examination. Inspection of cargo, collection of revenues, and other activities.

Delinquent Tax Collection. The collection of unpaid taxes and the securing of delinquent tax returns.

Tax Examination. The determination of correct tax liabilities through the examination of selected tax returns.

Tax Return Processing. The processing of tax returns and related documents, depositing and accounting for taxes collected, and maintaining taxpayers accounts.

Taxpayer Assistance. The provision of information and other services designed to assist citizens in paying taxes.

Department of Veterans Affairs

Acute Health Care. Activities in veterans' hospitals related to the provision of acute health care.

in accounting occurred during the period covered by CBO's productivity analysis and made it misleading to make year-to-year comparisons of the data reported by agencies.

Without CBO's adjustment, agency budgets showed increases in compensation costs that had as much to do with changes in accounting as with changes in personnel policies or other aspects of their operations. Under such circumstances, the measure OMB selected to monitor efficiency--that is, unit cost--would not accurately reflect agencies' progress. In fact, the CBO analysis indicates that, on average, calculations based on data reported by agencies show only about half the decrease in annual unit operating costs that agencies achieved between 1985 and 1987. To remedy this situation, CBO adjusted reported compensation expenses so that they reflect, for all three years covered by the analysis and for all employees, the government's estimated full accrual cost of retirement--about 23 percent of pay for FERS and about 28 percent of pay for CSRS. The adjustments assume, in effect, that the change in the government's accounting practices covering retirement had been in effect for all employees and for the entire 1985-1987 period. These anomalies in the reporting of retirement and other costs will have to be addressed if the data collected are to prove useful in evaluating and managing government operations.

All data on operating costs are based on actual experience with the exception of the 1987 information for the Departments of Transportation and of Veterans Affairs (DVA), which are estimates.[9] For most activities, data were reported for all three years, 1985 through 1987. For three activities--county operations (carrying out farm programs) at the Department of Agriculture, acute health care at the DVA, and tax return processing at the Department of the Treasury, only data for 1986 and 1987 were available. The CBO sample covers only nondefense activities that involved more than 5,000 jobs. For 1987, the 14 activities selected according to this criterion covered more than 235,000 full-time federal jobs in six federal departments, representing about 85 percent of the workers in all nondefense activities initially selected to participate during 1987 and 1988 in the productivity program.[10]

Data used in calculating unit cost and other factors are expressed in 1988 dollars (fourth quarter). Accordingly, changes in unit and other costs described in the text and tables exclude the effects of changes in prices between 1985 and 1987. CBO converted costs using deflators for the purchase of federal, nondefense services. (The deflators are prepared by the Commerce Department's Bureau of Economic Analysis and are also used by OMB.)

CHANGES IN UNIT OPERATING COSTS

Average annual unit operating costs dropped between 1985 and 1987 for 11 of the 14 nondefense activities examined by CBO (see Figure 1). The 11 agencies represent about three-quarters of the resources sampled. These cost decreases range from about 10 percent for the maintenance of air navigation facilities and equipment to just under 3 percent for the operation of air traffic control centers and for acute health care for veterans. Three activities, all at the Treasury Department's Internal

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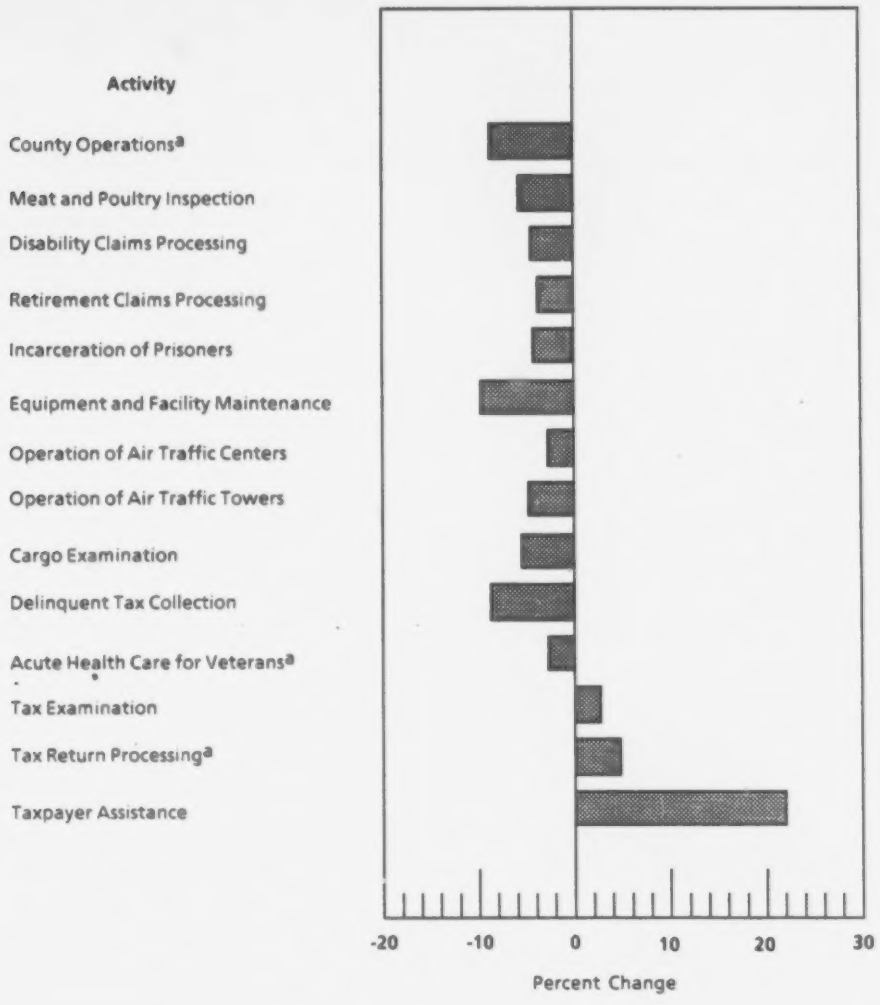
9. The Department of Transportation did not have "actual" data available. CBO used estimates for the DVA, because changes in the agency's measurement system made year-to-year comparison of data on actual experience meaningless.

10. For a narrative description of activities initially selected for the productivity program, see the Office of Management and Budget, Management of the United States Government, Fiscal Year 1988, pp. 36-47.

Figure 1.
Average Annual Change in Unit Costs Between 1985 and 1987, By Activity



SOURCE: Congressional Budget Office from unpublished agency reports.

NOTE: Data represent changes in real operating costs per unit of output.

a. Data are for 1986 and 1987 only.

Revenue Service (IRS), show increases in unit operating costs that range from 3 percent to 22 percent. For some activities, the average annual change in unit costs masks wide fluctuations in year-to-year changes. In the most extreme case, the 4.4 percent weighted average annual decline for incarceration activities covers a decrease of 10.7 percent between 1985 and 1986 and a 2.0 percent increase the following year. (As previously mentioned, the reported changes in costs are based on real dollars. Without adjusting for inflation, the decreases would be smaller and the increases would be larger.)

At current rates of improvement, most of the activities reviewed by CBO would easily meet the 3 percent annual improvement goal originally established for the government's productivity program. Whether agencies could continue recent performance, however, would depend in part on the availability of opportunities for improving operations. Although many activities show impressive decreases in unit costs consistent with original goals, performance for all 14 activities as a group falls short of targeted rates--only 2.5 percent a year. [11] The relatively low overall average occurs because of the three IRS activities that show cost increases instead of decreases.

Changes in Output and Costs

A variety of circumstances can cause reported unit costs to fall. For six of the eleven activities with decreases, output increased more than costs. In other words, agencies handled more work without similar increases in resources (see Figure 2). For five activities, the level of inflation-adjusted resources actually declined while output rose. Available information suggests that agencies managed to get by with fewer resources by consolidating facilities, automating activities, and adopting other measures designed to improve operations. In some cases, however, agencies appear to have found it necessary to accept some qualitative changes in the services delivered.

The catalyst for actions agencies may have taken cannot always be identified, although it is clear that the observed improvements or declines in efficiency cannot be entirely attributed to deliberate agency actions initiated as a result of the productivity improvement program. Wholly apart from current efforts, agencies have been forced to tighten their belts in the face of continuing budget deficits. The productivity program, moreover, is not the only management improvement effort in government, and many of the other efforts predate this initiative. Regardless of what precipitates agency actions, when agencies manage to cope effectively with ever-increasing requirements for their output--without corresponding increases in resources--taxpayers stand to gain.

The Growing Requirements for Government Service

Agency data reveal a rapidly growing demand for the services of federal agencies. (Outputs monitored for the activities included in efforts to improve productivity are diverse; they include the number of passports issued, national forest boundaries surveyed, meat inspections completed, and aircraft repaired.) All but one of the 14 sampled activities experienced growth in the demand for their output. Average annual increases ranged from 0.1 percent for claims processing at the Department of

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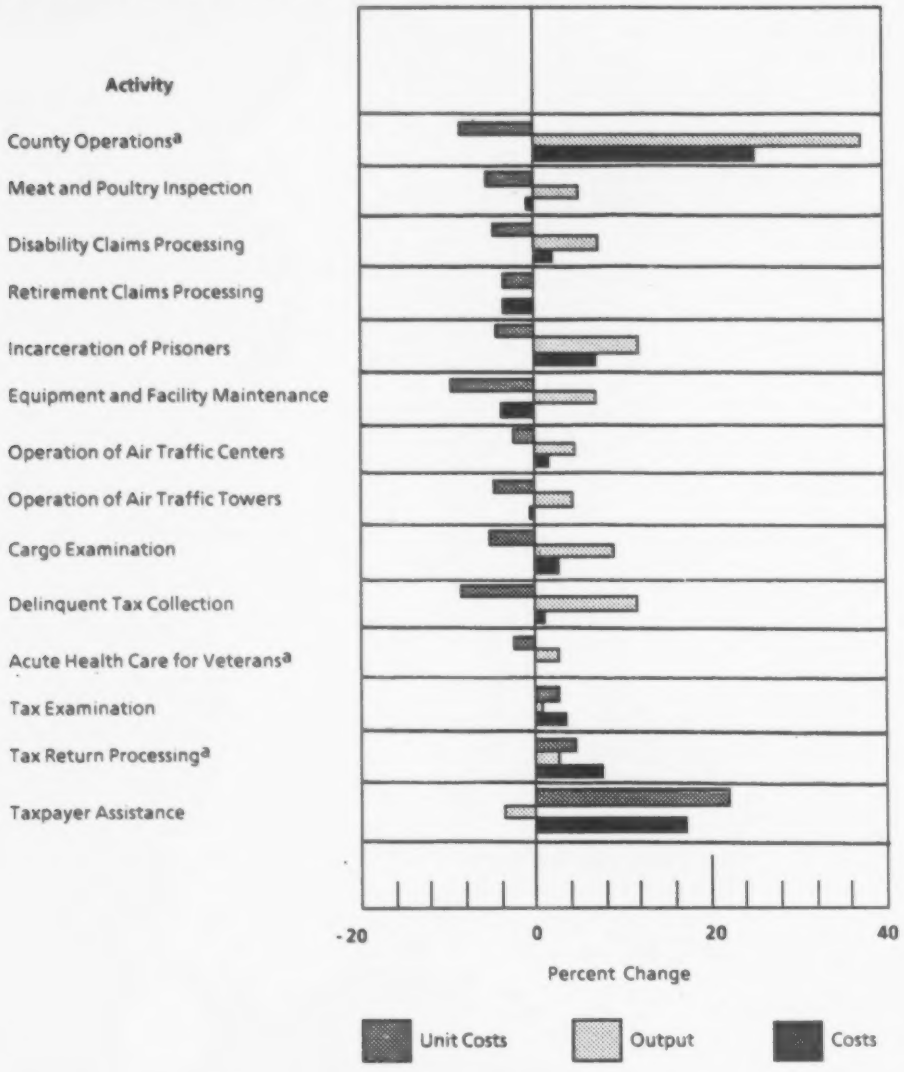
11. The weighted average annual decrease of 2.5 percent was calculated by CBO using operating costs. It should not be confused with the 0.103 percent decrease recently published by OMB. That estimate covers a different group of activities, different resources, and a different time period.

Figure 2.
Average Annual Changes in Output, Costs, and Unit Costs Between 1985 and 1987



SOURCE: Congressional Budget Office from unpublished agency reports.

NOTE: Data represent changes in real operating costs per unit of output.

a. Data are for 1986 and 1987 only.

Health and Human Services, to 38 percent for county operations at the Department of Agriculture. Taxpayer assistance is the only activity that reported a drop in output (measured as the number of calls from taxpayers for assistance). Efforts at the IRS to improve the quality of assistance and thus reduce the number of taxpayers who have to return for more help probably accounts for much of the 4 percent drop.

Discourse on productivity improvement generally centers on details of program management, but data on output for the 14 activities reviewed by CBO help illustrate that many factors can affect performance. As previously mentioned, unit costs represent the relationship between inputs (measured as program costs) and outputs (measured as units of the service provided). Yet the direction and magnitude of change for each of the two elements that enter into the calculations of unit cost are subject to a wide variety of influences, many beyond the control of agency management. For example, the rapid growth in demand for the output of county operations, which helped push down that activity's average unit costs, reflects the expanded participation in farm programs following enactment of the Food Security Act of 1985. [12]

Just as an agency ordinarily cannot control the demand for its services, its ability to control costs may also be limited. Expenditures ultimately will reflect funding decisions made by the Congress, based on recommendations from the Appropriations, Authorizing, and Budget Committees. But even agencies' attempts to use funds efficiently may be limited by factors not entirely within their control. For example, mandated organizational structures, employment levels, or operating procedures restrict management's flexibility in making the best use of available resources. Nevertheless, given the prospect of even tighter budgets in the future, an agency's success in finding ways to better use resources can mean the difference between effectively meeting the growing demand for services, and making cuts in the level or quality of services.

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12. Among other things, the Food Security Act of 1985 reduced price supports for certain agricultural commodities, which led more farmers to seek deficiency payments and other benefits under federal farm support programs.

CHAPTER III. ESTIMATES OF SAVINGS AND COSTS AND THEIR IMPLICATIONS

When agencies successfully meet the growing demand for federal services without corresponding increases in operating resources, taxpayers stand to benefit. One can think of the benefits as cost increases that have been avoided. For the 14 activities sampled by CBO, such savings totaled $940 million between 1985 and 1987. [13] This period covers two years of change in unit costs, 1985 to 1986 and 1986 to 1987. During this period, inflation-related increases in the cost of federal operations offset about two-thirds of the efficiency gains.

SAVINGS AND COSTS BY ACTIVITY AND TYPE OF RESOURCE

Eleven activities achieved two-year savings estimated at $1.2 billion in 1988 dollars. These savings range from $35 million for county operations at the Department of Agriculture, to $245 million for maintenance of air navigation facilities and equipment (see Table 3). By contrast, three IRS activities at Treasury, for which resources increased faster than output, caused costs to taxpayers to rise by $290 million. (Neither the estimates of savings nor the estimates of costs hold constant the quality of output.)

CBO examined how changes in two categories of resources--labor and nonlabor --contributed to the costs or savings realized for an activity. The analysis of labor resources considers changes in both labor productivity and employee compensation. As described in more detail below, savings were greatest in this category, totaling $965 million through 1987. The analysis of nonlabor resources considers changes in "other" costs for items such as contract services and supplies. Overall, agencies achieved few economies in the use of nonlabor resources. The CBO analysis indicates a net cost increase in the "other" cost category totaling $25 million through 1987. Some of this increase may reflect a greater reliance on private firms, rather than on federal employees, for support services.

CBO was unable to detail the reasons behind all the changes described below. Because the productivity program is young, many agencies cannot yet explain the data they initially collected and reported. In many cases, the information analyzed suggests only where further inquiry might yield information useful in future deliberations, within both the executive and legislative branches, on managerial effectiveness and on resource requirements. Data also suggest that care is needed in interpreting trends in unit costs. Increases in unit operating costs are not always cause for concern. In some cases, for example, they may reflect investments in training or other human capital improvements that offer the potential for future economies. Similarly, decreases in unit costs may not always signal more efficient use of resources--for example, when such decreases have been achieved through a reduction in the quality of services delivered.

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13. Estimates represent the difference between the actual costs and the costs that would occur in the absence of the observed changes in productivity. As in the previous section, estimates are presented in 1988 dollars and reflect the government's full accrual cost of federal retirement. The estimates of savings and costs described are not budgetary effects--that is, CBO made no attempt to determine the effect of costs avoided or incurred under the productivity program on federal budget balances. It would be virtually impossible to single out the cash effects of the productivity program from the effects of the many other factors that determine federal budget totals.

TABLE 3. TWO-YEAR SAVINGS AND COSTS, 1985-1986 AND 1986-1987, BY ACTIVITY AND SOURCE (In millions of 1988 dollars)

Activity	Savings/Costs from Labor Resources: Work Force Productivity	Savings/Costs from Labor Resources: Worker Compensation	Savings/Costs from Labor Resources: Total	Savings/Costs from Nonlabor Resources	Total
Activities with Net Savings Associated with a Drop in Unit Costs					
Agriculture					
County Operations a/	5	30	35	b/	35
Meat and Poultry Inspection	55	-20	40	45	80
Health and Human Services					
Disability Claims Processing	100	5	105	-10	100
Retirement Claims Processing	50	20	70	-15	55
Justice					
Incarceration of Prisoners	80	-40	40	100	140
Transportation					
Equipment and Facility Maintenance	160	35	195	50	245
Operation of Air Traffic Centers	60	35	90	b/	90
Operation of Air Traffic Towers	110	-5	105	5	110
Treasury					
Cargo Examination	120	20	145	-80	65
Delinquent Tax Collection	175	15	190	15	205
Veterans Affairs					
Acute Health Care a/	140	-35	105	b/	105
Subtotal	1,055	60	1,120	110	1,230
Activities with Net Costs Associated with an Increase in Unit Costs					
Treasury					
Tax Examination	-75	35	-40	-65	-110
Tax Return Processing	-5	-10	-20	-25	-40
Taxpayer Assistance a/	-95	b/	-95	-45	-140
Subtotal	-175	25	-155	-135	-290
Total, All Activities	880	85	965	-259	940

SOURCE: Congressional Budget Office, from unpublished agency reports.

NOTES: Details were rounded independently to the nearest $5 million. A minus sign denotes a cost. The savings estimates in this table should not be confused with the $700 million estimate recently published by the Office of Management and Budget. The OMB estimate covers both defense and nondefense activities, includes capital investment costs, and covers a different time period.

a. Data are for 1986 and 1987 only.

b. Less than $2.5 million.

LABOR RESOURCES

The 14 activities in the CBO sample generally are labor intensive. Data for 1987 show that personnel compensation, as adjusted by CBO, averaged about 80 percent of total operating costs. Agencies reduced the real labor costs required to produce each unit of output by an average of 3.5 percent a year. The economies associated with this drop in labor costs total $965 million in inflation-adjusted dollars.

The observed changes in labor costs per unit of output result from changes in both the size of the work force relative to the quantity of output and in the average real compensation paid each worker. CBO examined changes in both factors to determine the contribution each made to any economies an agency achieved.

Size of the Work Force

Analysis reveals that agencies generally managed to handle more work without commensurate increases in employment levels. Data on output per worker, a commonly used measure of labor productivity, illustrate the point. For the 14 activities as a group, the output or work associated with each worker rose at an average annual rate of 3.9 percent between 1985 and 1987. (This rate is about double the comparable rate reported by the Bureau of Labor Statistics for all nonpostal, nondefense agencies. See the appendix.) Resulting savings totaled $880 million--an amount representing about 95 percent of the estimated net savings from all sources. Experience varied, however, from activity to activity.

Eleven activities, each showing a decline in average unit costs, experienced an increase in the work, or output, associated with each worker. The average annual growth in labor productivity for this group ranges from 1.3 percent to 13.0 percent (see Table 4). Remarkably, for about half of these activities, improvements in worker productivity occurred because the size of the work force declined as output increased. In other cases, the work force simply did not grow as fast as output. Three IRS activities, each showing increases in unit costs, experienced losses in labor productivity. As previously mentioned, efforts to improve the quality of assistance to taxpayers helps explain the net loss for that activity.

Because agencies cannot always identify the specific actions or events that led to the changes in work force and output, it is difficult to assess the significance of these changes for programs and services. In the case of labor productivity, interpretation is particularly problematic because of requirements under OMB Circular A-76 that agencies obtain certain services from private firms. Contracting out can give the appearance of an increase in productivity where none has occurred. Nevertheless, agencies indicate that some of the improvements in output-to-labor ratios reflect streamlining of operations, automation, and other genuine efficiency enhancements. Part of the improvement in these ratios for air navigation maintenance activities, for example, reflects efforts to consolidate facilities. Work force economies can also arise when agencies invest in labor-saving equipment. Investment in computer assistance for all 2,800 county offices, for example, most likely helped keep the growth of employment for county operations well below the dramatic jump in work load that followed the passage of agricultural legislation in 1985.

In the case of other activities, improvements in output-to-labor ratios may actually be a cause for some concern. The 5.6 percent average annual gain in productivity for operation of air traffic control towers, for example, could indicate a work load that is inconsistent with the objective of maintaining air safety, although some analysts argue that it signals the realization of savings from investment in new

TABLE 4. CHANGE IN OUTPUT PER WORKER (In percent)

Activity	1985-1986	1986-1987	Average Annual Change, 1985-1987
Change for Activities with a Decrease in Unit Costs			
Agriculture			
County Operations a/	n.a.	1.3	1.3
Meat and Poultry Inspection	7.5	2.2	4.8
Health and Human Services			
Disability Claims Processing	10.6	9.4	10.0
Retirement Claims Processing	2.3	5.3	3.8
Justice			
Incarceration of Prisoners	4.5	8.4	6.4
Transportation			
Equipment and Facility Maintenance	11.7	10.3	11.0
Operation of Air Traffic Centers	5.4	-1.3	2.0
Operation of Air Traffic Towers	6.2	4.9	5.6
Treasury			
Cargo Examination	20.2	6.2	13.0
Delinquent Tax Collection	12.6	10.4	11.5
Veterans Affairs			
Acute Health Care	n.a.	4.9	4.9
Change for Activities with an Increase in Unit Costs			
Treasury			
Tax Examination	-1.5	-3.5	-2.4
Tax Return Processing	n.a.	-1.0	-1.0
Taxpayer Assistance	-24.7	-10.5	-15.2

SOURCE: Congressional Budget Office from unpublished agency reports.

NOTE: n.a. = not available.

a. Covers both federal and county employees who are paid by the federal government to carry out federal farm programs.

technology. For incarceration activities, changes in output-to-labor ratios reflect a growing prison population that increasingly taxes existing resources despite the best efforts of the Bureau of Prisons to cope. Among other innovations, the agency has adopted an automated prisoner management system and new architectural designs for prisons. Overcrowding and the potential for security problems remain, however, although new prisons are planned for early in the next decade. When new prisons go into operation, potential increases in unit costs may simply reflect improved conditions in prisons rather than cost inefficiencies.

Average Compensation

Changes in what each worker is paid can add to or offset any savings associated with labor productivity. Real increases in average compensation are defined here as increases above those implicit in the price deflator developed by the Bureau of Economic Analysis for measuring governmentwide increases in federal civilian compensation for nondefense programs. Changes in average real compensation between 1985 and 1987 varied within a narrow range. For 11 activities, these changes ranged from an increase of 2 percent to a decrease of 2 percent. More significant changes in average real compensation were registered for county operations (a decrease of 8 percent), for meat and poultry inspection (an increase of 3 percent), and for incarceration of prisoners (an increase of 3 percent). The 14 activities achieved net savings in real compensation costs totaling $85 million.

Again, the combination of factors that produced the changes in compensation costs are not always clear. Programmatic variables appear to have contributed to the changes experienced by some activities, and those variables take different forms. At the Department of Agriculture, for example, hiring necessitated by the passage of the Food Security Act of 1985 probably contributed to the drop in average compensation costs for county operations. Such hiring increased the portion of that activity's work force in lower-paying temporary and entry-level positions. At the Department of Justice, the increase in compensation costs partly reflects an increase in the use of overtime necessitated by the growth of the prison population. In other cases, significant changes in unit compensation costs could signal problems warranting the attention of federal managers and others responsible for federal programs. Increases not justified by changes in programs or in personnel policies, for example, could indicate misgrading, overstaffing, and other inefficiencies. Decreases in compensation costs may evidence a growing loss of ability to compete with private firms for high-quality workers.

APPENDIX. THE BUREAU OF LABOR STATISTICS' MEASUREMENT OF PRODUCTIVITY

The Bureau of Labor Statistics (BLS) also conducts a major effort to monitor federal government productivity. Several features distinguish the BLS program, which has statistics back to 1967, from the recent Presidential initiative. The BLS monitors labor productivity--the relationship between the quantity of services produced and the amount of labor required to produce them. The program includes data on the cost of labor but not on the cost of capital and other nonlabor resources. Unlike the Presidential initiative, the BLS collects no data on quality, and the information it reports is more useful for tracking governmentwide trends in efficiency than for agency planning in management and budget review processes.

The BLS's program is far more comprehensive than the current effort. The BLS collects data from 61 agencies on work performed by the equivalent of 2.1 million civilian employees, or 69 percent of the federal civilian work force. (Coverage is 42 percent at the Department of Defense, 100 percent at the U.S. Postal Service, and 73 percent for nondefense, nonpostal agencies as a group.) The BLS aggregates data into 28 broad functional categories. Some of the categories cover direct services to the public like health care, but others cover secondary services such as finance and accounting or military base support. For each category, indexes are prepared that show how much more or less federal workers produce over time. Indexes are also prepared on changes in the cost of labor per unit of output. The information is collected annually but is not available until about a year after the end of the period covered.

The activities covered by BLS include some also reported under the current effort. The overlap will probably grow as the new program expands. For some activities, however, agencies may be able to use the data collected for one program in preparing reports for the other.

According to the BLS, the labor productivity of the covered federal civilian work force increased at an average annual rate of 1.3 percent from 1977 through 1987. A slightly lower rate of growth, averaging 1.0 percent, was experienced by the U.S. Postal Service and the Department of Defense. For all other agencies as a group, productivity improvement over the period averaged 1.9 percent.

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